Vapor Intrusion Risk Pathway: Regulatory Updates

San Diego SAM Forum

September 2011

Blayne Hartman
Hartman Environmental Geoscience
858-204-6170
blayne@hartmaneg.com

Review of VI Guidances

- EPA OSWER
- EPA-OUST
- CA Agencies
- CA-Low Risk Closure Policy
- ITRC Guidance
- ASTM Screening Standard

EPA-OSWER Draft Guidance

- Tier 1: **Primary** Screening
  - Q1: VOCs present?
  - Q2: Near buildings?
  - Q3: Immediate concern?
- Tier 2: Secondary Screening
  - Q4: Generic screening
  - Q5: Semi-site specific screening (alphas from charts & tables)
- Tier 3: Site-Specific Pathway Assessment
  - Q6: Indoor air (and/or subslab)

Newest Changes (2012?)
EPA OSWER VI Guidance

- Tier 1: **Primary** Screening
  - Q1: VOCs present?
  - Q2: Near buildings?
  - Q3: Immediate concern?
- Tier 2: Source Screening
  - Generic screening using near-source samples
- Tier 3: Pathway (Building) Assessment
  - Multiple lines of evidence (sg & gw)
  - Sub-slab & Indoor Air Data

Guidance Updates

- Fed EPA (OSWER & Superfund)
  - Moving to sub-slab & indoor air
  - 7 to 30 day indoor air sampling period
  - Att factor of 0.1 for SG & 0.001 for GW
  - Modeling no longer an exit

- EPA-OUST: Guidance for HCs by 2012
  - Exclusion criteria by July 2011?
  - Testing of Biovapor model
  - FAQ by April 2011
  - Summary of State Guidances by April 2011

Allowable Benzene in GW
1e-6 risk

- New OSWER Guidance:

0.31 ug/m3/0.001 = 0.31 ug/L/0.2 = 1.5 ug/L

- CA-LUFT Exclusion Value: 1000 ug/L

~700 times lower than database suggests!!

CA Agencies

- CA-DTSC (& LA-RWQCB)
  - Soil Gas, VI, & Mitigation “Advisory”
  - CHHSLs (thanks to OEHHA)
- EPA Region 9
  - Follows the EPA Draft VI Guidance
  - Adopted Region 3 Screening Levels
- SF-RWQCB
  - ESLs include aliphatics!

Proposed DTSC Changes

- Preference for Sub-slab Samples
- Collect Exterior SG Samples At Source
- Repeated Sampling of Soil Gas
- Preference for Gaseous Tracers
- Raising Sub-slab AF to 0.05 (5x stricter)
- A Decision Matrix??

DTSC Defer to LUFT Manual for Petroleum HCs?

Proposed DTSC Changes

- Preference for Sub-slab Samples
- Collect Exterior SG Samples At Source
- Repeated Sampling of Soil Gas
- Preference for Gaseous Tracers
- Raising Sub-slab AF to 0.05 (5x stricter)
- A Decision Matrix??

DTSC Defer to LUFT Manual for Petroleum HCs?

ESL Update
(as of 1/27/11)

The San Francisco Bay region is not about to lower the ESL. The proposed ESL update would change the screening levels for a number of constituents and media/concerns (some up, some down) but the most significant change would be to the groundwater and soil gas screening levels for the vapor intrusion concern.

The proposed changes are based on a shift from model-based to empirically-based attenuation factors (and the USEPA database of empirically-derived attenuation factor) and would result in a 2-3 order of magnitude drop in those screening levels.

With respect to petroleum constituents, we will be recommending use of the State Board's LUFT Manual approach to addressing vapor intrusion at LUFT sites (versus using the ESLs in this context), so that biodegradation is explicitly considered.

LUFT Manual VI Sections

- Vapor Phase Fate & Transport (p. 62)
- Vadose Zone Attenuation Factors (p. 63)
- Soil Vapor Investigation (p.111)
- Soil Vapor Analysis (p.128)
- Risk/Site Screening Tool (p. 138)
- Appendix C – Vapor Intrusion

From New CA-LUFT

Based on these studies, a LUFT site is assumed to present no unacceptable risk from vapor intrusion if site conditions indicate that there is :

- *Dissolved* groundwater concentrations below 1000 micrograms per liter (ug/L) for benzene and 10,000 ug/L for TPH and 5’ from receptor.
- Free product is 30 or more from receptor

Under these conditions, it is assumed that natural attenuation is sufficient to mitigate concentrations

VI Risk Screening Tool (LUFT Manual p.138)

A LUFT site is assumed to present no unacceptable risk from vapor intrusion if the following conditions are met:

- *Dissolved* groundwater concentrations <1000 (ug/L) for benzene and <10,000 ug/L for TPH and 5’ of clean soil to receptor.

- *Dissolved* groundwater concentrations >1000 (ug/L) for benzene and >10,000 ug/L for TPH and 10’ from receptor.

- Free product is 30’ or more from receptor

Definition of Clean Soil (p.138)

- In the unsaturated zone, clean soil is defined as TPH concentrations less than 100 mg/kg or oxygen present concentrations >4%.

Under these conditions, it is assumed that natural attenuation is sufficient to mitigate Concentrations of volatile petroleum constituents

Soil Gas Allowed Levels

Benzene in Soil Gas, Residential Receptor, 1-6 Risk

			RBC (ug/m^3)
CHHSL			37
DTSC – S5			42
SF-ESL (subslab)			0.6
CA Proposed			85,000

ITRC VI GUIDANCE

- Practical How-to Guide
- Stepwise Approach
- Investigatory Tools (Toolkit)
- Thorough Discussion of Mitigation
- Scenarios Document
- Three Training Dates in 2011

The Net Widens: ASTM VI Standard

- Focus on Property Transactions
- Prescriptive Screening Distances
- No RBSLs (RBC)
- No Assessment Recommendations
- Released March 3, 2008
- Revised June 2010

ASTM VI Standard

Vapor Intrusion Condition (VIC) *is defined as "the presence or likely presence of any volatile chemical of concern in existing or planned structures on a property resulting from an existing release or a past release from contaminated soil or groundwater on the property or within close proximity to the property,* ***at a concentration that presents or may present a human health risk****."*

Liability Concerns

- Phase I Environmental Consultant
- Prospective/Current Property Owner
- Property Lender
- Property Insurer

Want to Know More?

- ITRC 2-day VI Training 2011
  - October 3 & 4: Denver
- AEHS Conf – San Diego, March 2012
  - EPA all day workshop
  - Petroleum VI all day presentations
  - Half-day session on non-petroleum VI

HARTMAN
ENVIRONMENTAL GEOSCIENCE

Blayne Hartman
Hartman Environmental Geoscience
H&P Mobile Geochemistry
858-204-6170
www.handpmg.com

H&P Mobile Geochemistry Inc.